

Fig. 1A.

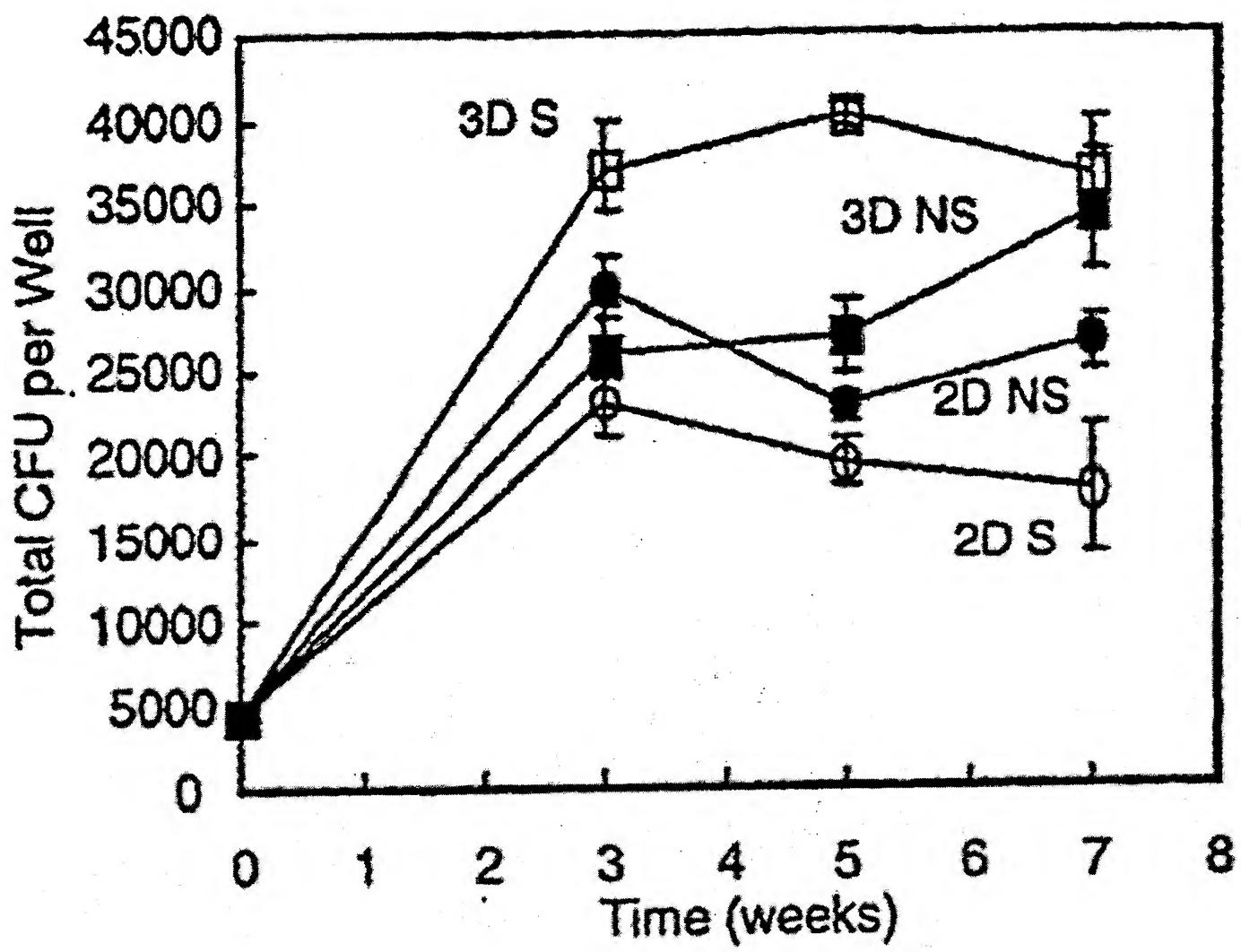
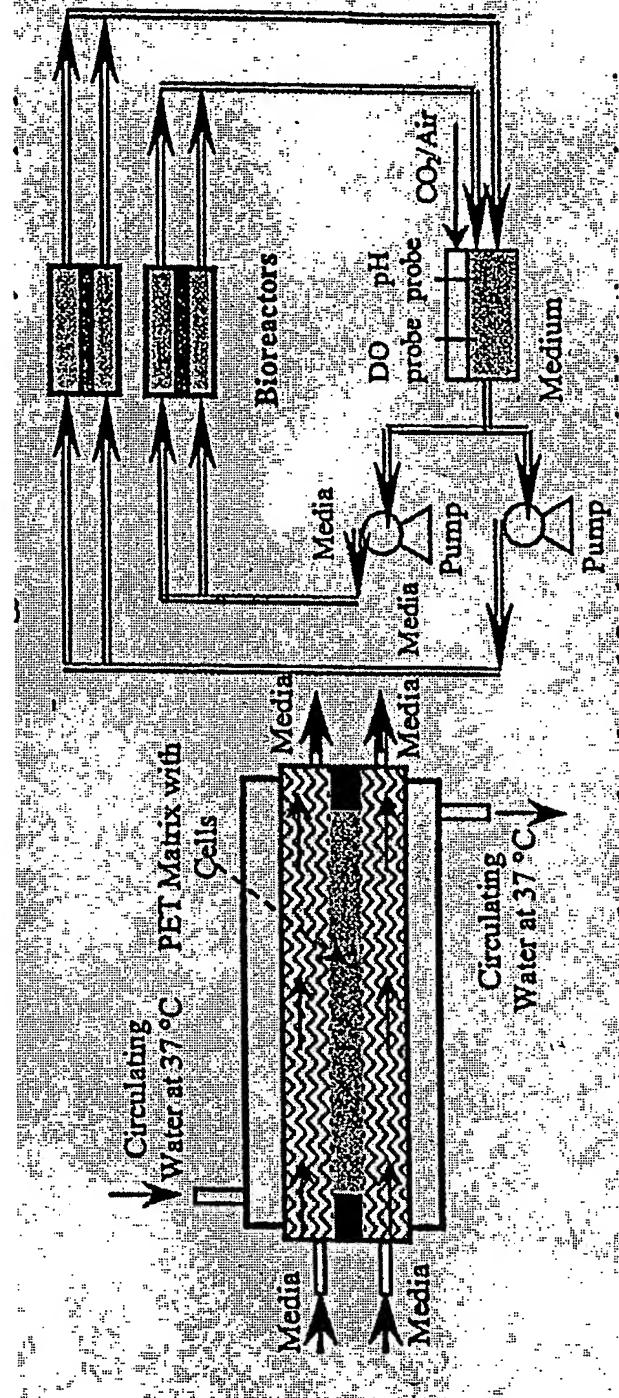
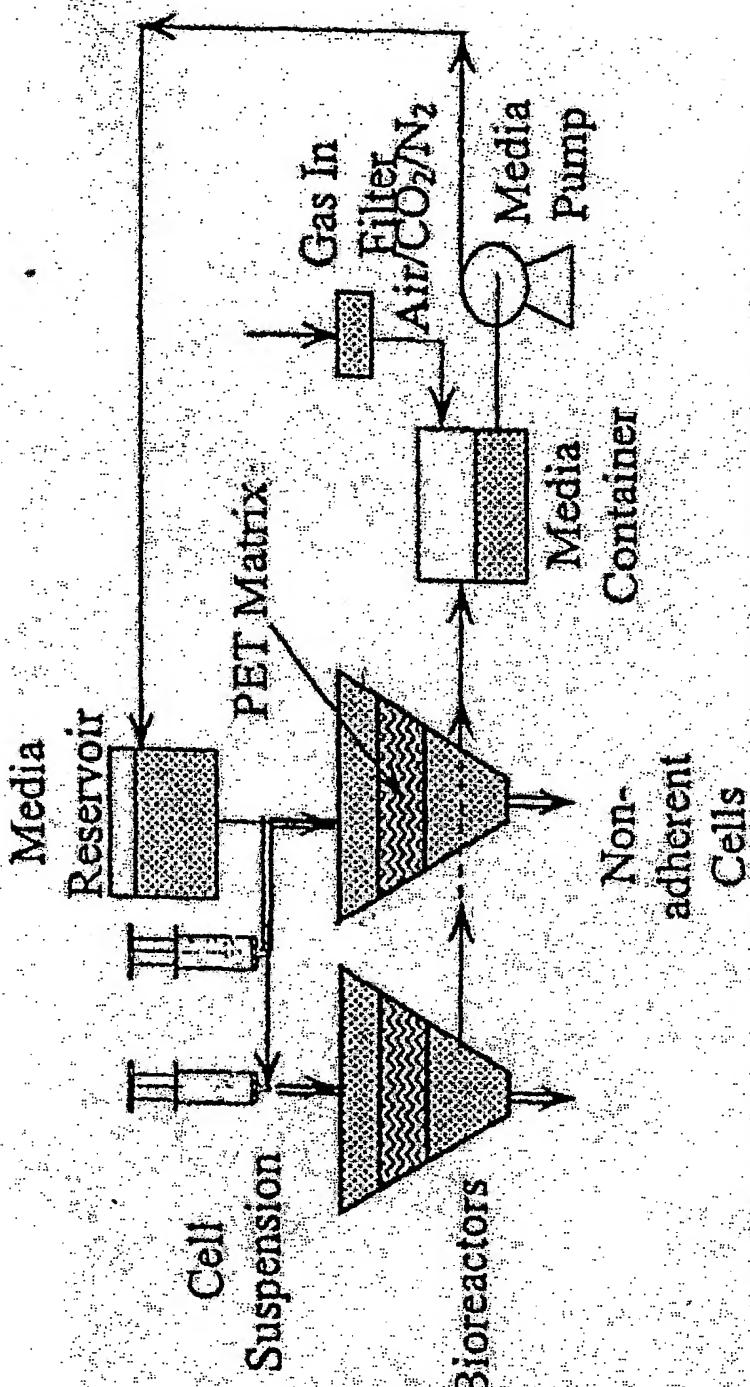


Fig. 1B.

Fig. 2.





Perfusion bioreactor system integrates dynamic seeding and culturing in the same device. Cell suspension will be mixed with media and perfused through the matrix. Periodic media flow will be applied to support cell growth and remove non-adherent cells and metabolites.

7/10/03

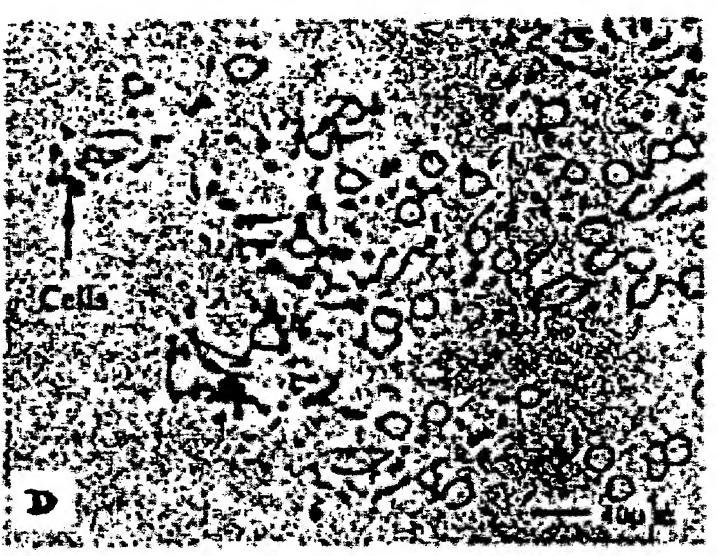
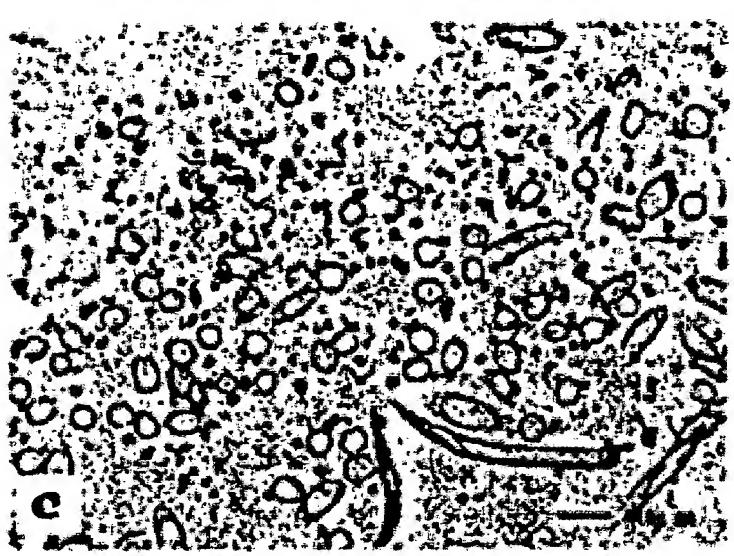


Fig. 4.

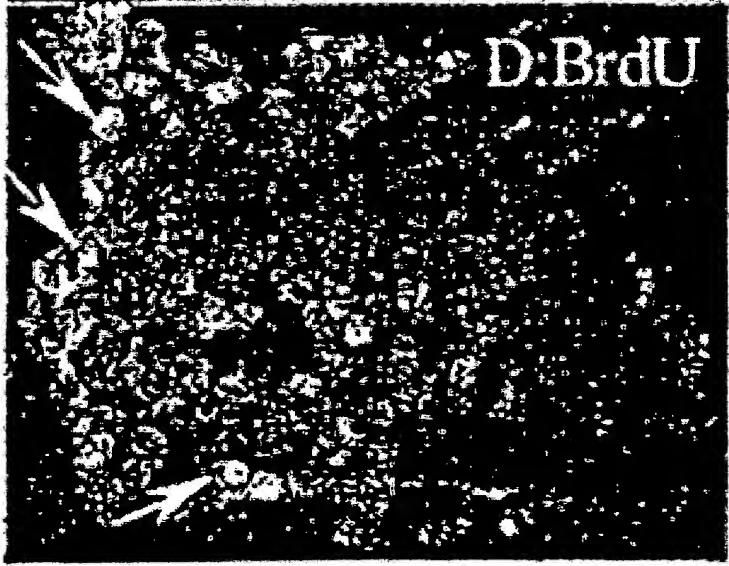
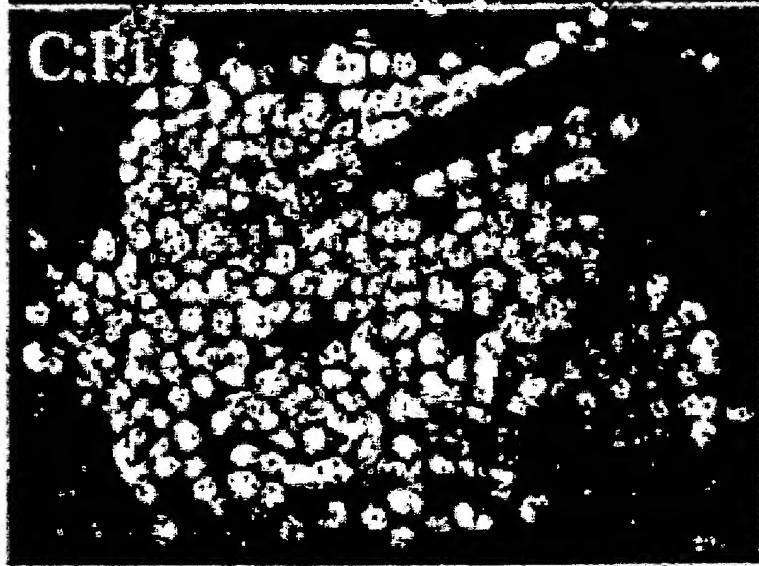
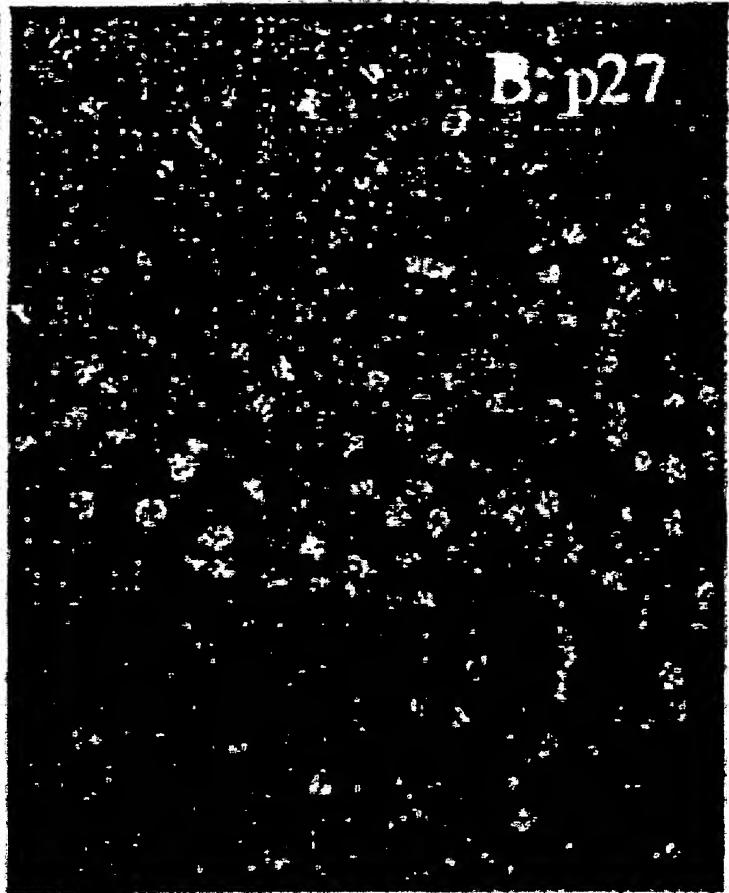
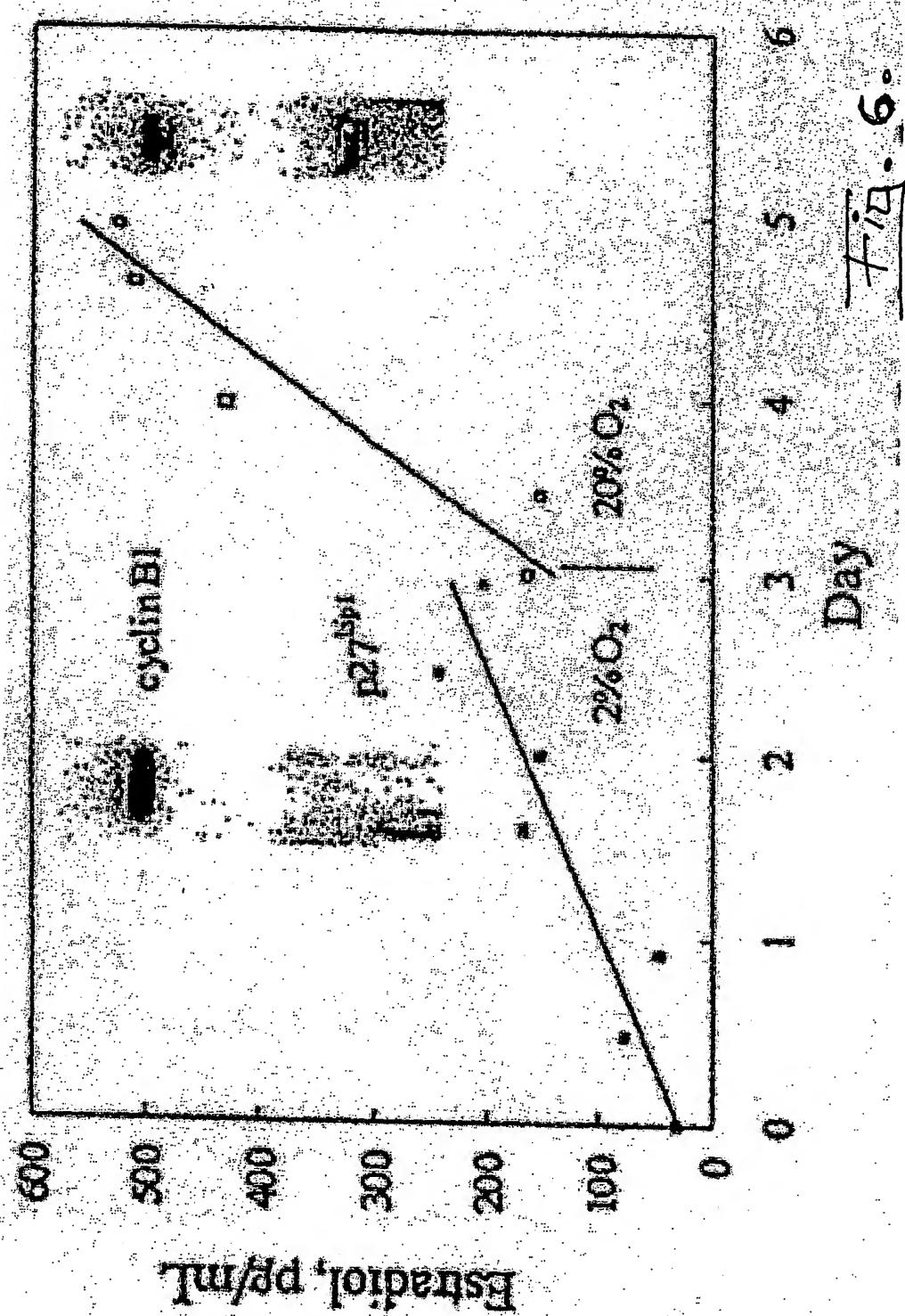
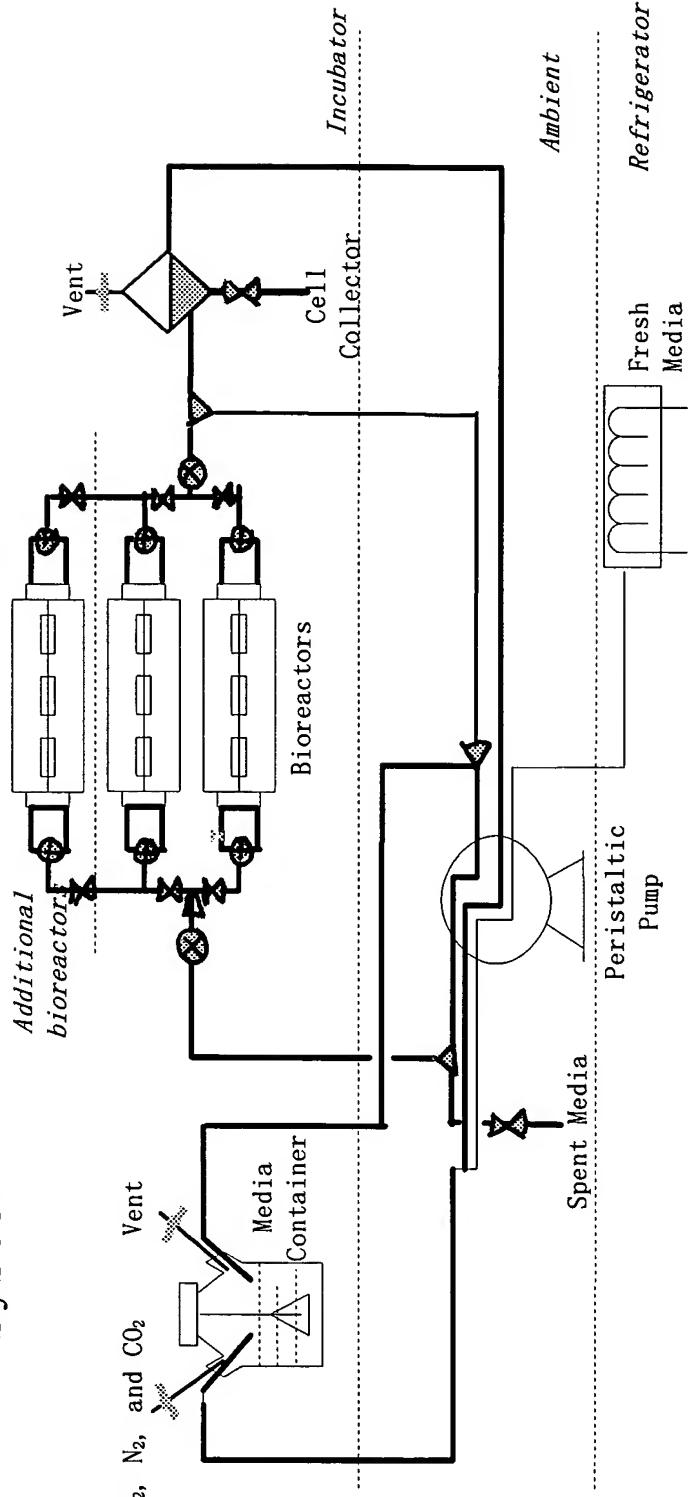


Fig. 5.



Flow Chart of Perfusion Bioreactor System



Name	Main loop	Seeding loop	Fresh media loop	Cell seeding port	Valve	Filter	T-connector	Media sampler
Symbol	—	—	—	●	☒	●	▼	☒
Function	Media flow	Cell suspension flow	Media supply	Cell suspension	Flow control	Sterile filter	Three-way connector	Collecting media sample
Size	0.89mm	0.89mm	0.89mm	2ml				7ml
Source	Pharmed	Pharmed	Pharmed	Afc	Fisher	U7765 ^a Fisher	U7765 ^a Cole-Parmer	Afc



Fig. 7.

MSCs Depth Filtration in the Perfusion Bioreactor System

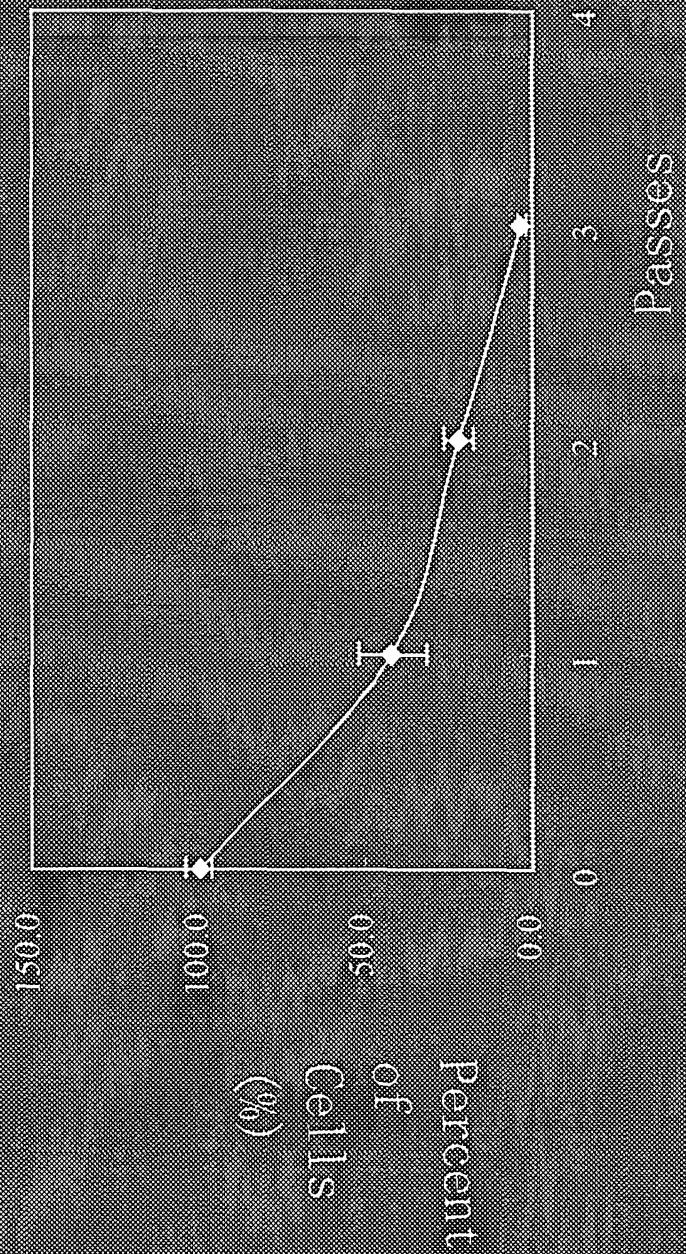
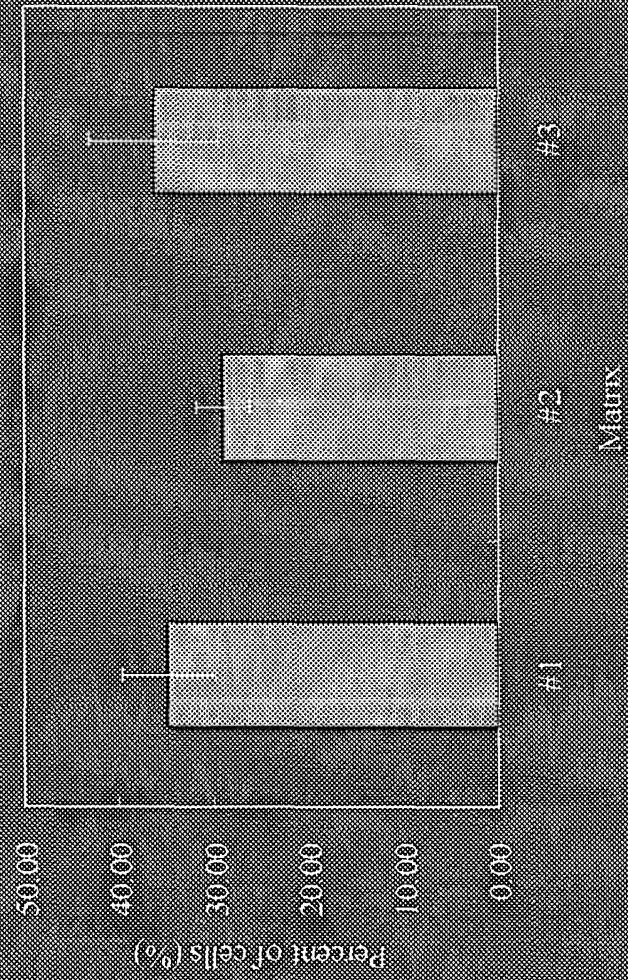


Fig. 8.

MSCs Distribution in PEI Matrices



T₁, T₂, T₃, T₄

Matrix

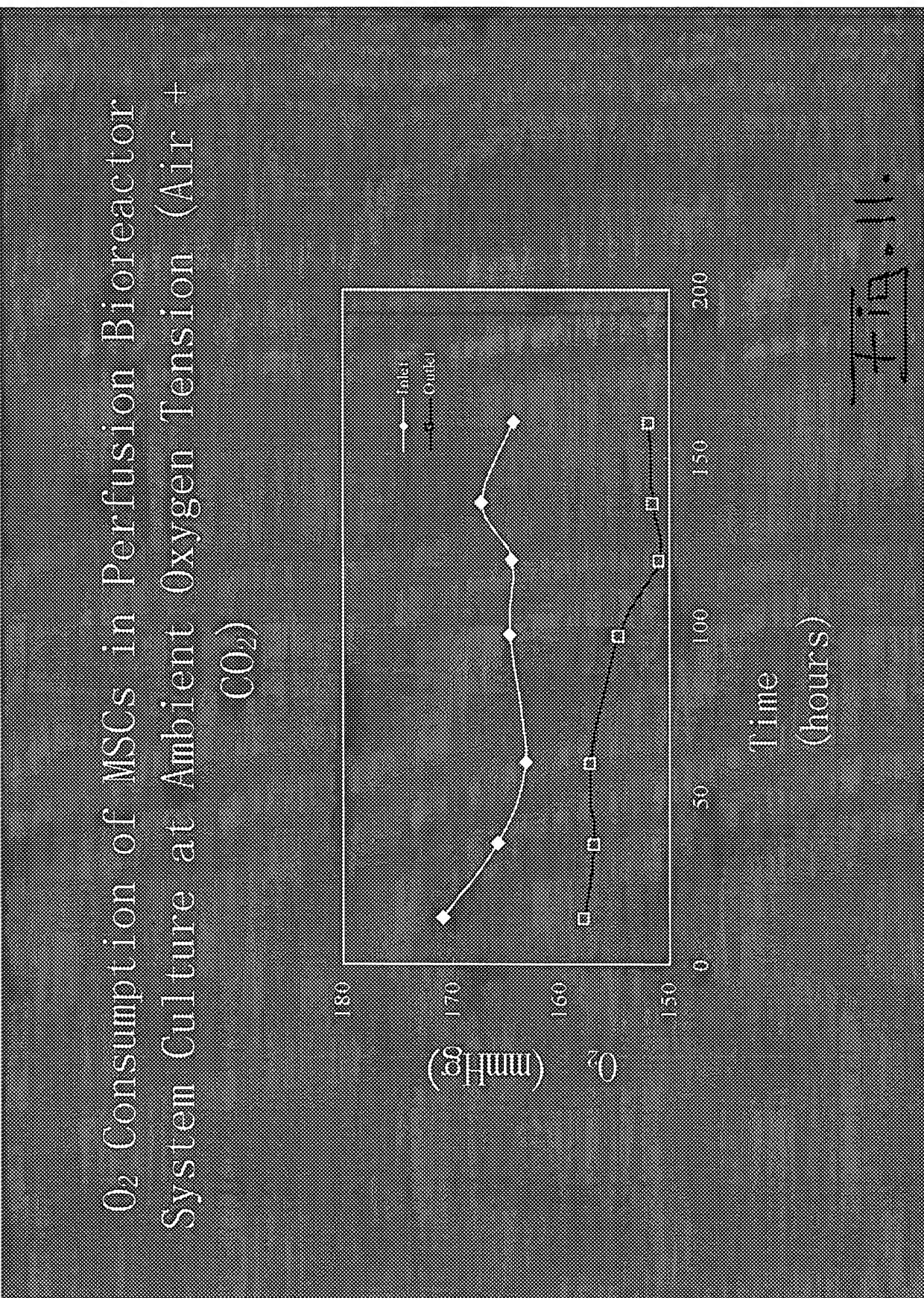
45
40
35
30
25
20
15
10
5
0

Percent of Cells (%)

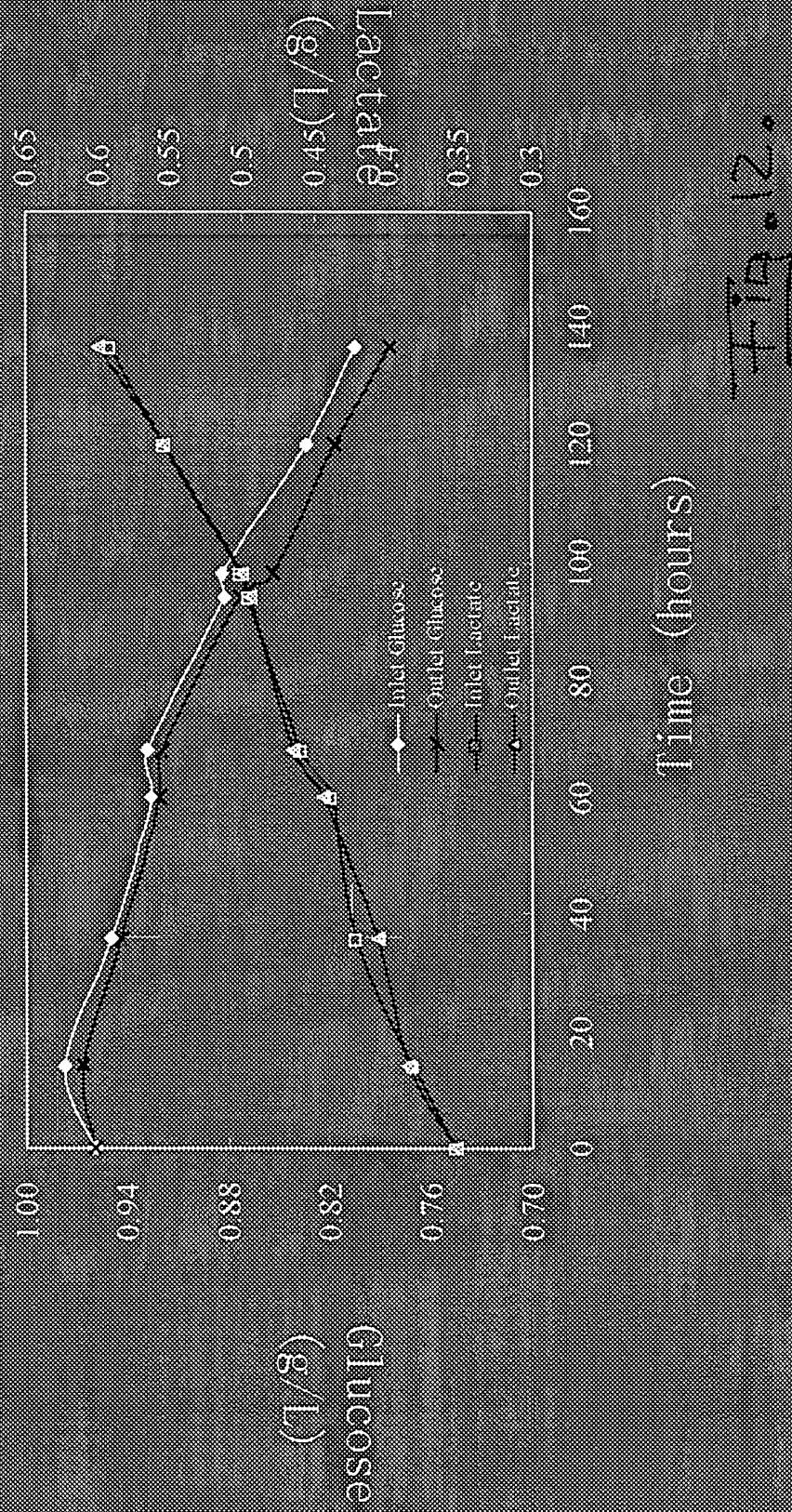
MSCS Distribution in PEI Matrices



PEI, 10.



MSCS Metabolism in Perfusion Bioreactor System Culture at Ambient Oxygen Tension (Air + CO₂)



LDH Level of MSCs in Perfusion Bioreactor System Culture at Ambient Oxygen Tension (Air + CO_2)

